This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An optical device that compensates for polarization mode dispersion (PMD) of an optical signal, comprising:

a first [rotating device] polarization state rotator that rotates the polarization angle of the optical signal in a frequency dependent-dependent manner; [and]

a first-order PMD compensator that receives the rotated signal and compensates for first-order PMD; and

a second [rotating device] polarization state rotator that receives the first-order compensated signal and inversely rotates the polarization angle of the first-order compensated signal in a frequency-dependent manner to compensate for higher-order PMD.

2. (Original) The optical device of claim 1, wherein the first [rotating device] polarization state rotator and the second [rotating device] polarization state rotator use substantially the same components.

3. (Cancelled)

4. (Currently Amended) The optical device of claim 1, wherein the first [rotating device] polarization state rotator performs a transform $\mathbf{R}(\omega\mathbf{K})$ and the second [rotating device] polarization state rotator performs a transform $\mathbf{R}^{-1}(\omega\mathbf{K})$, wherein $\mathbf{R}$ is an operator whose effect is equivalent to rotation in Stokes space, ω denotes the deviation from a central angular frequency of the optical signal and $\mathbf{K}$ relates to a variable delay.

5. (Currently Amended) The optical device of claim 1, [wherein the first rotating device] further comprising [comprises a second polarization rotator,] an interferometer [and a third polarization rotator] disposed between the first polarization state rotator and the second polarization state rotator.

6. (Original) The optical device of claim 1, wherein the optical device is adjusted such that the polarization at the center frequency of the optical signal is substantially not changed.

7. (Original) The optical device of claim 1, wherein the optical device has two adjustable delays.

8. (Cancelled)

9. (Original) The optical device of claim 1, wherein a transform is performed according to the equation:

$$M(\omega) = R(\omega)R(\omega K) \begin{bmatrix} \exp(i\omega\tau/2) & 0 \\ 0 & \exp(i\omega\tau/2) \end{bmatrix} R^{-1}(\omega K),$$ wherein R is an operator whose effect is equivalent to rotation in Stokes space, its argument (θ or ωK in the equation above) is a three-dimensional rotation vector whose direction is the axis of rotation in Stokes space and whose angle is the angle of rotation, ω denotes the deviation from a central angular frequency of the optical signal, K (the magnitude of K) and τ relate to adjustable delays.

10. (Currently Amended) In an optical device that compensates for polarization mode dispersion (PMD), a method for adjusting the optical device, comprising <u>the steps of</u>:

adjusting a group delay device <u>to compensate for first order PMD</u>; and

adjusting a device that performs a frequency-dependent polarization rotation in Stokes space <u>to rotate the polarization angle of an optical signal in a frequency dependent manner and to inversely rotate the polarization angle of the optical signal compensated for first-order PMD.</u>

11. (Cancelled)

12. (Original) The method of claim 10, wherein the group delay device includes at least a first adjustable frequency-independent rotating device and a delay τ.

13. (Cancelled)

14. (Original) The method of claim 10, wherein the optical device is adjusted such that the polarization at a center frequency of an optical signal is substantially not changed.

15. (Currently Amended) A method for compensating for polarization mode dispersion (PMD) of an optical signal, comprising:

first rotating [a first] the polarization angle of the optical signal in a frequency-[in]dependent manner to generate an intermediate optical signal, wherein the first rotating causes a first transformation $\mathbf{R}(\omega\mathbf{K})$ of the optical signal; [and]

compensating the intermediate optical signal for first-order PMD;

second rotating [a second] the polarization angle of the intermediate optical signal in a frequency-dependent manner to compensate for higher-order PMD, wherein the second rotating causes a second transformation $\mathbf{R}^{-1}(\omega\mathbf{K})$, wherein ω denotes the deviation from a central angular frequency of the optical signal and $\mathbf{K}$ relates to a variable delay .

16. (Cancelled)

17. (Currently Amended) The method of claim [16] 15, wherein compensating the intermediate optical signal comprises:

splitting the intermediate optical signal into a plurality of portions;

delaying at least one of the portions; and

combining the at least one delayed portion with at least a second portion of the plurality of portions.

18. (Cancelled)

19. (Cancelled)

20. (Original) The method of claim 15, wherein **R** is an operator whose effect is equivalent to rotation in Stokes space.

21. (Currently Amended) The method of claim 15, wherein performing the first rotating comprises at least performing a polarization state rotation of an angle θ about the axis defined by [the] <u>a</u> frequency-independent polarization controller[s], causing an interference of the optical signal and <u>the second rotating comprises</u> performing a second polarization state rotation by an angle $-\theta$ around the same axis.

22. (Original) The method of claim 15, wherein a transform is performed according to the equation:

$$M(\omega) = R(\omega)R(\omega K) \begin{bmatrix} \exp(i\omega\tau/2) & 0 \\ 0 & \exp(i\omega\tau/2) \end{bmatrix} R^{-1}(\omega K),$$ wherein R is an operator whose effect is equivalent to rotation in Stokes space, its argument (θ or ωK in the equation above) is a three-dimensional rotation vector whose direction is the axis of rotation in Stokes space and whose angle is the angle of rotation, ω denotes the deviation from a central angular frequency of the optical signal, K (the magnitude of K) and τ relate to adjustable delays.

23. (New) An optical device that compensates for polarization mode dispersion (PMD) of an optical signal, comprising:

a first polarization state rotator that rotates the polarization angle of the optical signal in a frequency-independent manner;

a second polarization state rotator that rotates the polarization angle of the optical signal in a frequency dependent-dependent manner;

a first-order PMD compensator that receives the rotated signal and compensates for first-order PMD; and

a third polarization state rotator that receives the first-order compensated signal and inversely rotates the polarization angle of the first-order compensated signal in a frequency-dependent manner to compensate for higher-order PMD.